

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of :

Uwe Anthes et al. Group Art Unit: Not Assigned

Serial No.: Div. of 09/325,796 Examiner: Not Assigned

Filed: June 26, 2001

For: COMPOSITION FOR PREPARING WATER-REPELLENT COATINGS ON
OPTICAL SUBSTRATES

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to initial examination, please amend the above-identified application as follows:

IN THE SPECIFICATION: After the title and before the first paragraph, please insert: -- This application is a divisional of U.S. Application Serial No. 09/325,796, filed June 4, 1999, which is incorporated by reference herein in its entirety. --

IN THE CLAIMS:

Please cancel claims 1-30.

Please add the following new claims. Since all the claims are newly added, no marked-up version is necessary.

– 31. A method for preparing an optical substrate coated with a water-repellent coating, comprising

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- a) mixing an electrically conductive or semiconductive support material comprising carbon; a conductive metal oxide, carbide, nitride or silicide; a metal powder and a non-conductive material; or a mixture thereof with a binder and subjecting the mixture to compression molding to form a compression molding,

b) sintering the compression molding at from 1100 to 1500°C in air to form a porous molding

c) impregnating the molding with an organosilicon compound,

d) ageing the impregnated molding, and,

- e) in the presence of an optical substrate, subjecting the aged impregnated molding under vacuum to treatment in an electron beam evaporator, or subjecting the aged impregnated molding under vacuum to vaporization at about 300 to 500°C.

whereby said impregnated organosilicon compound is vaporized and deposited upon the optical substrate.

32. The method of claim 31, wherein said aged impregnated molding is subjected to treatment in an electron beam evaporator.

33. The method of claim 31, wherein said aged impregnated molding is subjected to vaporization at about 300 to 500°C.

34. An optical substrate coated with a water-repellent coating, prepared by the method of claim 31.

35. A method for preparing an optical substrate coated with a water-repellent coating, comprising subjecting, in the presence of an optical substrate, a porous electrically conductive molding which is impregnated with an organosilicon compound to treatment under vacuum in an electron beam evaporator, or subjecting said impregnated molding under vacuum to vaporization at about 300 to 500°C, thereby vaporizing said organosilicon compound and depositing it upon the optical substrate,

wherein said porous electrically conductive molding comprises carbon; a conductive metal oxide, carbide, nitride or silicide; a metal powder and a non-conductive material; or a mixture thereof.

36. The method of claim 35, wherein said impregnated molding is subjected to treatment in an electron beam evaporator.

37. The method of claim 35, wherein said impregnated molding is subjected to vaporization at about 300 to 500°C.

38. An optical substrate coated with a water-repellent coating, prepared by the method of claim 35.

39. A method for preparing an optical substrate coated with a water-repellent coating, comprising subjecting, in the presence of an optical substrate, a porous electrically conductive

molding which is impregnated with an organosilicon compound to treatment under vacuum in an electron beam evaporator, or subjecting said impregnated molding under vacuum to vaporization at about 300 to 500°C, thereby vaporizing the organosilicon compound and depositing it upon the optical substrate,

wherein said impregnated molding is obtainable by ageing a sintered compression molding which is impregnated with an organosilicon compound,

wherein said electrically conductive molding comprises carbon;

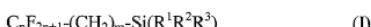
a conductive metal oxide, carbide, nitride or silicide; a metal powder and a non-conductive material; or a mixture thereof.

40. The method of claim 39, wherein said impregnated molding is subjected to treatment in an electron beam evaporator.

41. The method of claim 39, wherein said impregnated molding is subjected to vaporization at about 300 to 500°C.

42. An optical substrate coated with a water-repellent coating, prepared by the method of claim 39.

43. The optical substrate of claim 42,
wherein said organosilicon compound is of formula I



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wherein

R¹ is an alkoxy of 1 to 3 a carbon atoms or C_nF_{2n+1}-(CH₂)_m-Si(R²R³)-O-,

R² and R³ are each independently alkyl or alkoxy of 1 to 3 carbon atoms,

n is 1 to 12 and

m is 1 to 6.

44. The optical substrate of claim 42, wherein

said conductive metal oxide is indium oxide or tin dioxide which is optionally doped with

antimony, fluorine, phosphorus, niobium or tantalum,

said metal carbide is titanium carbide, chromium carbide or tungsten carbide,

said metal nitride is chromium nitride or tungsten nitride,

said metal silicide is molybdenum silicide, titanium silicide, or chromium silicide,

said metal powder is titanium, zirconium, silicon, chromium, nickel or iron, and/or

said non-conductive material is silicon oxide, aluminum oxide, zirconium oxide,

aluminum silicate or a mixture thereof.

45. The optical substrate of claim 42, wherein said organosilicon is triethoxy

(3,3,4,4,5,5,6,6,7,7,7-undecafluoroheptyl)silane, triethoxy (3,3,4,4,5,5,6,6,7,7,8,8,8-

tridecafluoroctyl)silane, triethoxy (3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-

heptadecafluorodecyl)silane, diethoxymethyl (3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-

heptadecafluorodecyl)silane, or bis[ethoxymethyl(3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoroctyl)

silyl ether.

46. The optical substrate of claim 42, wherein said electrically conductive molding comprises 50 to 90% by weight of an electrically non-conductive material and 10 to 50% by weight of a metal powder, or wherein said electrically conductive molding comprises 40 to 60% by weight of aluminum silicate and 20 to 60% by weight of silicon powder.

47. The optical substrate of claim 42, wherein said ageing is performed for a time sufficient to cleave said organosilicon compound.

48. The optical substrate of claim 34, wherein said binder is polyvinyl alcohol, glycerol, methylcellulose, dextrin or a wax, and the concentration of said binder in said compression molding is 1-20% by weight.

49. The optical substrate of claim 34, wherein said compression molding is in the form of a tablet which has a diameter of 10-15 mm and a height of 5-10 mm, or in the form of a granule which has a particle size of 1-4 mm, and/or wherein said porous molding has a porosity of 40-60%.

50. The optical substrate of claim 34, wherein said compression molding is heated in air at 400-600°C before sintering it at 1100-1500°C.

51. The optical substrate of claim 42, wherein said electrically conductive molding

comprises an electrically conductive material with the exception of a metal, or a mixture of an electrically conductive material and an electrically non-conductive material.

52. The optical substrate of claim 42, wherein said vacuum is 10^5 - 10^3 mbar.

REMARKS

Claims 1-30, in amended form, drawn to a composition for preparing a water repellent coating on an optical substrate, a method of making the composition, and a method for coating an optical substrate using the composition, were allowed in the parent application, Ser. No.

09/325,796. Those claims have been canceled and replaced by the instant claims, drawn, *e.g.*, to methods of making an optical substrate coated by with a water-repellent coating, and to a coated optical substrate made by such methods.

In view of the fact that the compositions used for making the instantly claimed optical substrates have been deemed allowable, the optical substrates are also allowable. Therefore, the instant claims are believed to be in condition for allowance, which action is respectfully requested.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,



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